

Amended
weight melamine, at least 10% by weight of said filamentous fiber material and at least 40% by weight of said thermosetting resin [and being at least 70% by weight organic material].

Claim 25, line 1, change "bisphenyl" to -bisphenol--.

Claim 26, line 1, after "said" insert -filamentous--;
 line 1, after "fiber" insert -material--.

Amended
 28. (amended) A fuse tube having an arc-quenching bore for interrupting arcs resulting from a wide current range including low currents and high currents, the arc-quenching bore having a predetermined taper at one end thereof and comprising fiber, an effective amount of arc-quenching compound and a binder, said arc-quenching compound being present in sufficient quantity by weight in said arc-quenching bore so as to effectively interrupt arcs resulting at the low currents and said predetermined taper being sufficiently high to prevent gas stagnation due to gas generated by said arc-quenching compound at the high currents, said binder comprising a thermosetting resin being selected from the group consisting of cycloaliphatic epoxy resin, bisphenol-A epoxy resin and mixtures thereof, said arc-quenching bore comprising by weight 10-35% melamine, at least 40% thermosetting resin and at least 10% fiber.

Amended
 36. (amended) A method of fabricating an arc-quenching tube via the winding of a first fiber in one or more winding passes, the method comprising winding the arc-quenching tube such that the first fiber lays flat and does not overlap in each of the one or more winding passes whereby uniformity is achieved in the thickness of the tube, the method further comprising forming a predetermined taper within the arc-quenching tube wherein the predetermined taper defines a minimum predetermined wall thickness of the tube, the uniformity being such that variations in the thickness of the tube are significantly less than the minimum predetermined wall thickness.

REMARKS

The Examiner is respectfully requested to review this application which has been amended after a careful consideration of the Examiner's comments in the above-identified Office Action and the references cited therein, the Examiner's comments being appreciated to correct and clarify the specification and claims. Specifically, claims 2-4, 6-7, 9-12, 14, 16, 21-23, 27, 29-32, 34, 35, 37 and 38 have been canceled without prejudice or disclaimer of the invention recited therein,

independent claims 1, 13, 24, 28 and 36 have been amended to more distinctly point out and clarify applicants' invention, and dependent claims 5, 15, 17-20, 25, and 26 have also been amended for appropriate dependency and clarification. In the above-identified Office Action, the Examiner rejected the claims as being unpatentable over various combinations of the the Rinehart, Tobin and Schmunk references. Independent claims 1, 13, 24, 28 and 36 as amended, and claims 5, 8, 15, 17-20, 25-26, 33 and 39, depending therefrom and as amended, are neither disclosed nor suggested by the references and are now considered to be in allowable form.

For example, Claims 1 and 13, as amended, are directed to an arc-quenching composition that is useful to fabricate high-strength fuse tubes suitable for interrupting currents over a wide current range, e.g. from as low as 100 amperes through 12000 amperes RMS. The combination of strength to survive the tremendous pressures during arc interruption and the ability to provide desirable arc-extinguishing characteristics over this extremely wide range is achieved by the recited composition, e.g. regarding claim 1, melamine in the range of 15-30% along with at least 10% fiber and 50% thermosetting resin, and regarding claim 13, an arc-quenching compound from the selected group, and at least 10% fiber material and 50% thermosetting resin. The results achieved by this composition are unexpected with the recited materials. For example, the Rinehart reference teaches using epoxy resin, fiber and 40-80% by weight of aluminum trihydrate. This is a totally different approach that requires a high percentage of the inorganic filler and the reference only discusses a rating of 5000 amperes. The Tobin reference is another different approach that teaches giving strength to the fuse tube by molding thermosetting and arc-extinguishing materials about a fiberglass cloth layer or sheath located nearer the exterior, the materials including epoxy resins and melamine or like materials. Thus, this composition is neither disclosed nor suggested by the prior art. In fact, the composition can only achieve the desired characteristics when utilized in combination with suitable bore tapering as discussed further below in connection with claim 28 and the necessary strength is achieved only by use with an outer layer of higher strength material as discussed below in connection with claim 24. Accordingly, applicants' invention as recited in claims 1 and 13, as amended, patentably distinguishes over the prior art and these claims are in allowable form. Further, claims 5, 8, 15, and 17-20 depending from these claims recite additional aspects of applicants' invention and are also considered to be in allowable form. For example, these claims recite additional characteristics of materials and the composition.

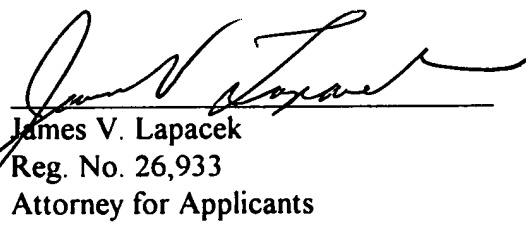
Applicants' invention as recited in claim 24, as amended, is directed to a fuse tube having a multiple layered laminate construction including an inner arc-quenching surface layer comprised of a wound filamentous fiber material supported in a matrix comprising a thermosetting resin and melamine, and also including at least one outer layer of filament wound glass fiber reinforced thermosetting resin, the outer layer being bonded to the inner arc-quenching surface layer whereby no dielectric or mechanical interface is present between the inner and outer layers, the inner arc-quenching surface layer comprising at least 10% by weight melamine, at least 10% by weight of the filamentous fiber material and at least 40% by weight of the thermosetting resin. This fuse tube is neither disclosed nor suggested by the prior art and claim 24, as amended, is allowable for the same reasons as discussed above in connection with claims 1 and 13. Similarly, claim 28, as amended, is also considered to be allowable for the same reasons as claims 1 and 13 and is directed to a fuse tube with the recited material composition and also including a tapered bore to achieve a wide current interrupting range. Thus, claims 24 and 28, as amended, and claims 25, 26, and 33, depending from claims 24 and 28, are considered to be in a condition for allowance, the dependent claims reciting additional features.

Applicants' invention as recited in claim 36, as amended, recites a method of fabricating an arc-quenching tube via the winding of a first fiber in one or more winding passes, the method comprising winding the arc-quenching tube such that the first fiber lays flat and does not overlap in each of the one or more winding passes whereby uniformity is achieved in the thickness of the tube, the method further comprising forming a predetermined taper within the arc-quenching tube wherein the predetermined taper defines a minimum predetermined wall thickness of the tube, the uniformity being such that variations in the thickness of the tube are significantly less than the minimum predetermined wall thickness. The prior art neither discloses nor suggests the combination of a taper and a uniformity of winding being so achieved for producing such a fuse tube. The Examiner broadly concludes that it is obvious to "minimize gaps" without citation of any art. However, applicants' invention is directed to a uniformity of winding such that the minimum wall thickness defined by the desired taper is unaffected by the winding variations. This provides as shown in FIGS. 4 and 5, a minimum thickness of the inner layer of the fuse tube while ensuring that the normal erosion of the arc-extinguishing bore during repetitive use does not extend into the outer layer that does not have the same arc-extinguishing properties. Such is important when providing the high strength and wide current interrupting range in a fuse tube that

can interrupt 12000 amperes. Thus, claim 36, as amended, and claim 39 depending therefrom are allowable, claim 39 additionally reciting the winding of a second fiber over the first fiber.

Accordingly, claims 1, 5, 8, 13, 15, 17-20, 24-26, 28, 33, 36 and 39, as amended, are considered to patentably distinguish over the cited reference, and these claims and this application are considered to be in a condition for allowance. A favorable action to that end and allowance of this application by the Examiner are respectfully requested. If the Examiner feels that clarification of any issue or comment herein would be helpful to facilitate prosecution of this application, the Examiner is respectfully requested to contact the undersigned attorney at the number listed below for a telephonic interview or to arrange a personal interview.

Respectfully submitted,



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